



**ETICA Project<sup>1</sup>**



## **A framework for identifying emerging ethical issues in future and emerging technologies**

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Discussions on future technologies will to a large extent usually centre on how an already existing technology or technologies can be improved upon and/or on how new and emerging technologies will improve and better lives. Rarely, if at all, is there a discussion on identifying potential ethical issues as future and emerging technologies are being developed or how ethical issues will be tackled as they come to light during the process of their development. The expectation is twofold, either that ethical issues will be dealt with when the technology is already in existence and in full use or that research and development of future technologies will follow some form of ethical guidelines as work commences. For example, when we look at the European Commission's ethical guidelines for undertaking Information and Communication Technology (ICT) research in the Seventh Framework programme (FP7), emphasis is on conduct of ICT research which calls for the researcher to be aware of the dignity, rights and freedoms among other concerns of those that may be involved in the research. The guidelines also call for privacy and informed consent when involving research participants. In addition, the guidelines also touch on the issue of security of personal health data for those whose research centres on health care among others. These are mostly guidelines that researchers should adhere to and check as they embark on their ICT research. However, little is outlined in terms of how researchers and indeed developers of future and emerging technologies can go about identifying ethical issues as they arise when the technologies are being developed beyond fulfilling the initial ethical guideline requirements. Granted, the guidelines warn researchers to be aware of dangers associated with the process of ICT research that may be encountered during research. However, as a way of guarding

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against the potential dangers, researchers are advised to carry out prior assessment risks and then identify precautionary actions against any potential risk in the research. This implies that the risks should be handled well before the developers embark on developing the technology/technologies.

However, in order for any future and emerging technologies to make a difference, this paper argues that potential ethical pitfalls are bound to surface not only at the planning stages of a future technology but during the process of development as well. As such, rather than just deal with the ethical issues at the start or planning stages of a technology development, developers should be more proactive and identify ethical issues during the process and up to the time the technology is ready for use. This means that a lot more ethical problems that would have been missed at the planning phase of the development of the future technology could potentially come to light during the development process. As a result, this lessens potential ethical problems in the future. In addition, identification of any ethical problems during the development process ensures that technology developers are more sensitive to users needs and therefore develop technologies that users find more suitable. Furthermore, identifying ethical issues during the process of development ensures that developers not only think of meeting the ethical requirements as outlined in a standard ethical guideline but that they become accustomed to being alert to any ethical pitfalls throughout the development stages of future and emerging technologies.

To this end, this paper proposes a discussion on identifying future and emerging technologies and their subsequent ethical issues. The paper is based on the fundamental ideas that are being developed in the ETICA project. It will discuss the merits of identifying potential ethical issues as future and emerging technologies are being developed. It will discuss a potential framework within which arising ethical issues may be identified. By starting this discussion we can ensure that future and emerging technologies will really make the difference when their subsequent ethical issues are proactively identified and dealt with not only during the planning stages but during the development and implementation processes as well.